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TRANSMITTAL FORM

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Application Number	10/699,857
Filing Date	11/03/2003
First Named Inventor	Wang, Chi
Art Unit	1745
Examiner Name	
Attorney Docket Number	CSW-03-01

Total Number of Pages in This Submission: 2

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
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- ☐ Drawing(s)
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Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Philip H. Kier
Signature	Philip H. Kier
Date	03/08/2004

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IN THE U.S. PATENT AND TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re: Application No.: 10/699,857
Filing Date: 11/03/2003
Group Art Unit: 1745
Applicant: Chi S. Wang
Title: Plasma reformer for hydrogen production from water and fuel

PETITION FOR SPECIAL STATUS UNDER 37 CFR 1.102(c)

The applicant hereby petitions for advancement of examination under 37 CFR 1.102(c) based on the invention materially enhancing the quality of the environment, materially contributing to the conservation of energy resources, or both. No fee is required for this petition.

STATEMENT

This invention relates to the thermal reforming of gaseous or vaporized, fossil-based or renewable hydrocarbons and dissociation of H_2O in a plasma reformer to produce hydrogen. The hydrogen produced can be used directly as a fuel for heat or propulsion, or it can be used in a fuel cell to produce electricity for stationary or vehicle applications. Hydrogen has long been recognized as an ideal fuel for power generation systems because its use results in virtually no emissions of air pollulants and greenhouse gases. An invention that fosters the use of hydrogen consequently enhances the quality of the environment. Also, fuel cells are more energy efficient than combustion engines. Therefore, an invention that fosters the use of fuel cells replacing combustion engines contributes to the conservation of energy resources.

Because the invention uses H_2O as well as hydrocarbons to produce a given amount of hydrogen, less hydrocarbon fuels are used to promote conservation of fossil fuels and renewable fuels (e.g., ethanol). Also, because water is significantly cheaper than fossil or renewable fuels, use of this invention will reduce the cost of producing hydrogen and thereby improve the economic competitiveness of fuel cell power generation.

The present invention is a reformer that dissociates a gaseous H_2O/hydrocarbon fuel input mixture in a non-equilibrium thermal plasma environment. The heart of the reformer is a reaction chamber. The outer lateral wall of the reaction chamber is an emitter electrode and the inner lateral wall is a collector electrode, the emitter electrode and the collector electrode forming an electric circuit. The emitter electrode contains a multiplicity of thin needle-like extrusions. External electricity causes electrons to be emitted copiously from the needle-like extrusions. These high energy electrons are absorbed by hydrocarbon molecules and ionize the hydrocarbon molecules to create a greater number of lower energy electrons than were absorbed. These lower energy electrons in turn interact with H_2O to dissociate it. A non-combustion pyrolysis process is used to create and maintain this environment. Dissociation of H_2O is induced by ionization in the plasma environment.

For these reasons, the applicant believes the application is eligible for special status under 37 CFR 1.102(c).

Respectfully submitted,

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